



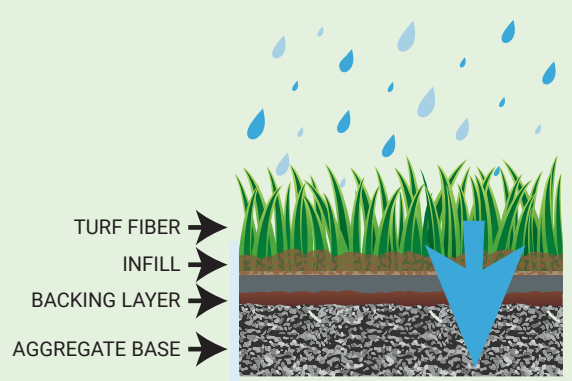
Not all synthetic turf fields are the same when it comes to water quality

By Jenée Colton

If you or your child play soccer or other sports on synthetic turf fields, you may be familiar with crumb rubber. Crumb rubber turf fields contain small rubber pellets (“infill”) in between the blades of plastic grass that make the field softer and keep the blades from flattening with use. The technical name for these pellets is “infill.” All of King County’s, and most of the region’s synthetic turf fields use crumb rubber as infill. One reason crumb rubber infill became popular for synthetic turf fields is because it is considered environmentally friendly—it is a recycled product, made from ground vehicle tires, so it diverts waste from our landfills.

However, over time, researchers nationwide discovered that crumb rubber infill can release zinc into stormwater runoff at levels suspected to be toxic to aquatic animals, such as fish. Because Washington state and King County consider all synthetic turf fields pollution-generating surfaces, stormwater regulations require that runoff from these fields be treated to reduce concentrations of zinc and other metals (called “enhanced stormwater treatment”). Due to this treatment for metals, King County’s crumb rubber fields are not suspected of causing environmental problems in our streams. However, construction

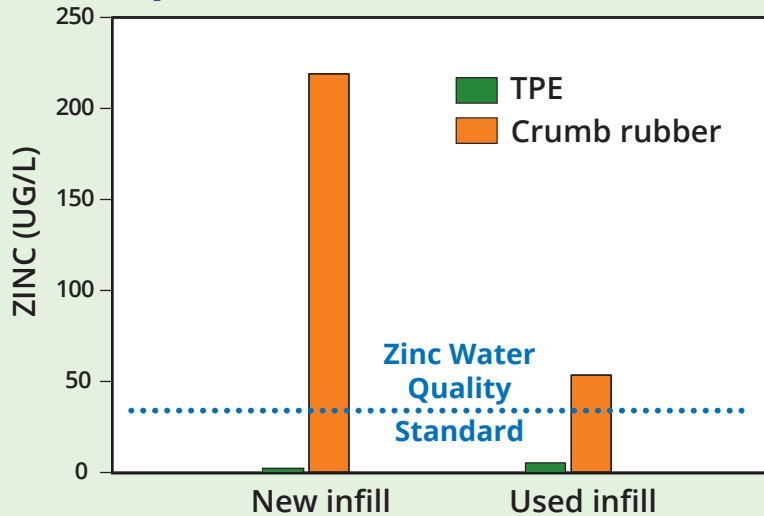
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The problem

Crumb rubber releases zinc to stormwater above the aquatic life water quality threshold, and potentially other chemicals at levels toxic to human health and aquatic life. King County is seeking another more environmentally friendly product.

Zinc in new and used TPE compared to crumb rubber leachates



Zinc, and perhaps copper, in leachate from crumb rubber were at levels of significant concern for aquatic life (see graph). Our study results indicate TPE presents less water quality concerns than crumb rubber and does not appear to be a regrettable substitute. Therefore, King County will consider using TPE infill in new playfields as they are scheduled for replacement rather than crumb rubber infill. ■

and maintenance of enhanced stormwater treatment technology is costly and limits design options for playfields. Finding an alternative synthetic turf infill that does not require this level of treatment would provide flexibility and potentially save King County money.

To address this issue, we evaluated the leading alternative to crumb rubber infill to see if it released metals at levels that would require enhanced treatment of runoff, like crumb rubber, and to see if it released other contaminants that may also be toxic to aquatic life or human health. The intent was to avoid selecting a “regrettable substitute” where you replace one problematic product for another which presents a different, and perhaps bigger problem. The top infill alternative was a product called TPE Pro-Max 37 (TPE), a manufactured thermoplastic elastomer made from food-grade plastic.

We collected samples of both new TPE and crumb rubber from the manufacturers, as well as used infill from existing fields. Then, we soaked infill material for 18 hours in mildly acidic water (pH 5). The resulting water (leachate) was tested for more than 100 contaminants and the results were compared to state water quality standards. A greater number of metals exceeded water quality standards in new and used crumb rubber leachates than in TPE leachates. In new and used TPE leachate, no metals were detected at levels expected to cause toxicity to aquatic life or human health. In addition, no other contaminants were present at levels expected to be toxic to human health or aquatic life.

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